

Passage through perisaturnium, 1852, Nov. 17^h 520^s
G.M.T.

Perisaturnium	240° 10' 9"
Excentricity	0 ^h 12 01 11
Semi-axis major	217 ^h 05

It will be seen that the position of the perisaturnium had undergone a great change in the interval between the above epochs: the rapid motion of the line of apsides has been known for some time past to those who have attempted the determination of elements of Hyperion. Prof. Hall had at first supposed this motion direct, but he now adopts the smaller retrograde motion, and so finds for the motion of the line of apsides in a Julian year, — 2° 9' 28.62". If we assume that 394 revolutions of the satellite had been performed in the interval between the epochs (8379'3172 days), the anomalistic period is found to be 21^h 2673026 days.

Prof. Hall thinks that the next step must be the calculation of the action of the great satellite Titan on the motion of Hyperion, a work which he hopes to be able to undertake. Not only is there a near approach of the orbits of the two bodies, but it would appear that Hyperion is moving in a larger orbit, than would correspond to the assigned period and Bessel's mass of Saturn. There is a probability that the approximation of the two satellites may be, at certain times, very close indeed. If we bring up Bessel's elements of Titan to 1875, and compare them with the above elements of Hyperion for the same year, we find an exceedingly near approach of the two bodies, when the position of the perisaturnium of Hyperion corresponds to that of maximum distance of Titan, and though uncertainty in the elements may affect the result, it is sufficiently evident that the motion of Hyperion cannot be followed satisfactorily without a knowledge of the action of Titan. Prof. Hall remarks that in 1882 it may be possible with the Washington refractor to follow Hyperion completely round its primary, as was done by Mr. Lassell at Valetta in 1852, and that from that time until 1888 it should be carefully observed.

THE OXFORD UNIVERSITY OBSERVATORY.—The report of the Savilian Professor of Astronomy, as Director of the University Observatory at Oxford, has been issued, for the year ending on the 4th of the present month. The 12½ inch refractor has been in constant use in the determination of accurate positions of about 40 stars in the Pleiades, partly with the view of ascertaining the proper motions by comparison with the observations of Bessel half a century ago, and partly with the intention of comparing the micrometrical measures with those of the costly heliometer. The results will appear in Part II. of the Oxford Observations, and we may remark that the Savilian Professor will have a recent standard for comparison in M. Wolf's elaborate work on the Pleiades, (*Description du Groupe des Pleiades* in the *Paris Annales*, t. xiv.), to which he has not made allusion in the report. The De la Rue reflector has been employed in taking photographs of the moon, and nearly three hundred have been secured. With the view of ascertaining how far these photographs can be relied upon for accurate measurements, micrometrical measures of the shadows of several prominent lunar mountains were made with the refractor, simultaneously with the taking of photographs with the reflector; the latter being then measured in the De la Rue engine, it was found that the telescopic and photographic results were in close accordance, indeed within the limits of the unavoidable errors of observation. The Professor adduces a still further proof of the reliability of celestial photography in this direction, in the close accordance of the moon's semi-diameter, as measured and computed from sixteen of the Oxford photographs with Hansen's value adopted in the *Nautical Almanac*; the difference is only 0".12. Amongst the other miscellaneous work of the Observatory during the past year, the periodical comets of Tempel (1873 July) and Brorsen

have been well observed. In the Lecture Room discourses have been delivered on the Astronomy and Astronomical Instruments of Ptolemy and Hipparchus, on the Physical Libration of the Moon and on Solar Physics.

The obligation under which this institution remains to the great liberality and scientific spirit of Dr. De la Rue is well known. The salary of the photographic assistant has been defrayed by him during a period of four years, this subsidy, a most important one to the rising Observatory, terminating in December next. The necessary provision for the future effective conduct of the Observatory is under the consideration of the University Commissioners, subject to the final judgment of Convocation. It is suggested by the Savilian Professor in his report, that for the next few years a sum of 600*l.* annually may suffice to cover all necessary expenses. The desirability of an early publication of results, in the actual state of Astronomical Science, appears to be fully appreciated in the Oxford establishment: part I. of the Observations containing the work to December 1877 was published in the spring of 1878.

A NEW COMET.—A pretty bright telescopic comet was detected, apparently on the 16th inst., by Mr. Lewis Swift, of Rochester, N.Y. Prof. Winnecke observed it at Strasburg on June 21, and found its position at 11*h*. 38*m*. 46*s*. mean time in R.A. 2*h*. 47*m*. 31*s*. Decl. 64° 29' 5"; daily motion in R.A. trifling, that in Decl. about one degree towards the north; diameter about three minutes.

GEOGRAPHICAL NOTES

AT the meeting of the Royal Geographical Society on Monday evening, after a feeling allusion by the Earl of Northbrook to the loss sustained by the Society by the death of Mr. R. B. Shaw, British Resident at Mandalay, who was well-known for his excellent geographical work in Eastern Turkistan, &c., some reports were read which had recently been received from Mr. Keith Johnston, the leader of the East African Expedition. The first was an exceedingly interesting account of his preliminary trip from Zanzibar to the Usambara Hills, and the second was a memorandum of information obtained regarding routes between Dar-es-Salaam and the north end of Lake Nyassa. It is no exaggeration to say that the latter document contained more real geography than many travellers contrive to collect in the course of a long journey, and it confirms the impression that Mr. Johnston, if he be spared, will, on his return from the interior, furnish us with a most admirable and accurate account of the country traversed, the greater part of which is at present absolutely unexplored. The Secretary afterwards read letters from Mr. Johnston and Dr. Kirk, H.M.'s Consul-General at Zanzibar, announcing the final start of the expedition for the interior, under the most favourable circumstances. Mr. Johnston has with him one European assistant and 138 porters, who have been carefully selected with the aid of Chuma, Livingstone's old follower, who also accompanies the party.

THE last sitting of the Geographical Society of Paris, was devoted to a lecture given by M. Cosson to prove (1) that M. Roudaire's contemplated Algerian sea would not improve the climate of the Sahara; (2) that in case any alteration were possible it would be detrimental to the health of the inhabitants; (3) that it would create dissatisfaction amongst the Tunisian and Algerian tribes, and even Algerian colonists; and (4) that it would have no effect in attracting to Algiers the trade of the Soudan. Commander Roudaire not having been invited to answer the charges proffered against his scheme the discussion was adjourned, but several members warmly protested against the assumption brought forward by M. Cosson, and tried to rebut his assertions.

CAPTAIN R. H. NAPIER, R.N., has communicated some useful hydrographic notes to the Hong Kong

Government Gazette respecting the Chinese island of Hainan and the Gulf of Tongking. The following are the positions determined:—Hoihow Fort A, lat. $20^{\circ} 3' 13''$ N. long. $110^{\circ} 19' 3''$ E.; Pakhoi Customs flagstaff lat. $21^{\circ} 29' 1''$ N. long. $109^{\circ} 6' 6''$ E.; Guie-chow Island summit lat. $20^{\circ} 1' 15''$ N., long. $109^{\circ} 6' 31''$; Cape Cami lat. $20^{\circ} 11' 58''$ N., long. $109^{\circ} 54' 57''$ E.; North Taya Island, lat. $19^{\circ} 58' 1''$ N., long. $111^{\circ} 16' 1''$ E.

IT is stated that Major Serpa Pinto will come to London soon to give a lecture on his recent journey across Africa.

SIR SAMUEL BAKER, who has spent the last six months in traversing the island of Cyprus in a gipsy waggon, carefully observing all the natural phenomena, is engaged in writing a book to be called "Cyprus as I saw it in 1879," which will be published by Messrs. Macmillan and Co.

THE newly published *Bulletin* of the Belgian Geographical Society contains two papers by their indefatigable vice-president, Colonel Adan, one of which is entitled "Sur la Participation des Officiers aux grands Travaux de Géographie Scientifique." M. Greiner contributes some notes on the cultivation of tobacco. We are glad to observe that considerable space (upwards of 29 pp.) is devoted to "Chronique Géographique," and much care is evidently bestowed on the collection of matter. Among these notes there is one of much interest on the proposal for connecting Liège and Escaut by means of a canal.

THE ever-interesting *Monatschrift für den Orient* for June contains several papers of varied interest. Georg v. Gyurkovics writes on the trade politics of Bulgaria; Dr. G. Schweinfurth sends from Cairo some notes on Rohlfs' last exploring journey in Tunisian territory. In view of the new relations of Germany with the Samoan Islands, Dr. Hubbe-Schleiden's article on Germany in the Pacific is well-timed, and so from another point of view is Herr Josef Hras's letter from Shanghai on the Kulja Question. Under the title of Tsin and Ta-Tsin Count Schweiger-Lerchenfeld contributes a learned paper on the old trade routes of the Chinese.

THE principal paper in the June number of Petermann's *Mittheilungen* is a long account by M. A. Woeikoff of his travels in Yucatan and the south-east provinces of Mexico in 1874. As might be expected from so accomplished and experienced a traveller, the paper is very comprehensive and full of original observations on the many interesting features of the region visited. Dr. P. Jonas, contributes the conclusion of a paper begun some time since on Venezuela, describing a journey he made through the Llanos to the Apure. Dr. Emin Bey continues his valuable narrative of his journey from Mruli to the chief town of Unyoro, and Herr B. Hassenstein describes the north coast of Siberia between the mouth of the Lena and Behring Strait.

NEWS, dated February 23, have just been received at Vienna from the Hungarian Expedition travelling in China under the leadership of Count Bela Szechenyi. Count Szechenyi, Lieutenant Kreitner, and Herr L. Loczi, started from Sia-an-Sen, and after a very laborious march of 20 days, during which they had to pass several mountain chains measuring more than 3,000 metres in height, finally arriving at Lan-Chan-Sen. The province of Shen-Si, where, as in Shan-si and Konan a famine was raging, showed decay and ruin everywhere; the same state of things prevailed in the province of Kiang-Su. The long rebellion of the last years has left these unenviable traces. The expedition intended to leave for Su-tshou on February 14, on which march they would have to pass the Hoang-ho river.

At the last meeting of the Berlin Geographical Society the President, Dr. Nachtigal, communicated the latest reports received from the German African travellers.

Engineer Schütt has started on his journey into the interior and believes that he has now succeeded in overcoming all the difficulties which at first presented themselves to his further progress towards the East and North; he now intends entering the country of the Adjellengo tribe. Dr. Buchner was detained at Cassenge through the rainy season. He intended leaving for the interior at the beginning of May. Dr. Gerhard Rohlfs has had much to endure from the fanaticism of the natives at Djalo, where he is still staying, and has also been unable to obtain a guide through the Wadai desert on account of the unfriendliness of the Bengasine Government. His companion Dr. Strecker has returned to Bengasi in the meantime in order to attempt to make the Government more favourably disposed towards Dr. Rohlfs' undertaking.

ON June 3rd the Dutch North Polar Expedition sailed from Amsterdam on board the "Willem Barends." The ship is equipped with all necessaries for 10 months.

A CARAVAN from Abyssinia has arrived at Marseilles, being destined for the acclimatization garden of Paris. It is composed of 15 men, 4 women, 2 children, 32 camels, 4 oxen, 2 zebras, 4 elephants, 8 ostriches, asses, and horses from Dongola and Abyssinia.

THE Batavian Society of Arts and Science have published in English in a recent volume of their Transactions some curious notes on the Malay Archipelago and Malacca, which have been compiled from Chinese sources by Mr. W. P. Groeneveldt.

NOTES

WE regret to say that although all critical symptoms have disappeared, Sir Wyville Thomson is not regaining strength so fast as was at first hoped. It will be some time still before he can attend to business letters. In the meantime all communications connected with *Challenger* matters should be addressed either to Mr. John Murray, his Principal Assistant, *Challenger* Office, 31, Queen Street, Edinburgh, or his Secretary, Mr. George Leslie, University, Edinburgh.

PROF. A. R. RAMSAY has been elected a Foreign Corresponding Member of the R. Accademia dei Lincei. At the same time Drs. vom Rath and Donders were elected to a similar honour.

PROF. AUGUST KROENIG, the author of "Grundzüge einer Theorie der Gase," died at Berlin on June 5, after a year's illness.

In the death of Prof. Carl Theodor Ludwig Neubauer, to which we briefly alluded in our last number, German chemistry has lost one of its most accomplished specialists. Neubauer was born at Lüchow in 1830. After a fair high-school education and some experience as an apothecary he entered, at the age of twenty-three, the laboratory of the famous analytical chemist, Fresenius, at Wiesbaden, in the capacity of assistant. In 1856 he commenced his pedagogical career as privat-docent, and received in 1864 a professor's chair. At an early period he became a recognised authority in various branches of analytical, agricultural, and physiological chemistry, and especially in the chemistry of the urine, to which he has always devoted his chief attention. His researches in this department embrace the detection of various normal and abnormal constituents previously unknown, and the elaboration of exact methods for the qualitative and quantitative analysis of urine. The manual of Neubauer and Vogel on this subject, which reached its seventh edition in 1876, is regarded as the most exhaustive and complete work of the kind. The various higher derivatives of the urea group occurring in nature, such as xanthin and kreatin, were also made the base of careful research. Neubauer's investigations into the chemistry of wine have likewise